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Notes:

1. Untranslatable words are replaced with asterisks (****).
2. Texts in the figures are not translated and shown as it is.

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FULL CONTENTS

[Claim(s)]

[Claim 1]A mounting method of a surface mounted part article to a printed-circuit board characterized by comprising the following.

A process at which a method of forming a solder layer on a pad which has carried out pattern formation on a printed-circuit board, and making a lead terminal of a surface mounted part article the back weld in contact with this pad top screen-stencils only a resinous principle which constitutes a solder paste, and forms an adhesive layer on a pad of a printed-circuit board.

A process of placing upside down right above a solder spraying tub which blows off solder powder in the shape of spraying by air pressure, conveying said printed-circuit board, making solder powder sticking on a pad, and forming a solder layer, A process of contacting, carrying out reflow **** of the lead terminal of a surface mounted part article on a pad of this printed-circuit board, and welding this lead terminal.

[Detailed Description of the Invention]**[0001]**

[Industrial Application]This invention relates to the mounting method to the printed-circuit board of a surface mounted part article. Large scale-ization by a unit element child's miniaturization follows the semiconductor device with which, as for an information processor, small large scale-ization constitutes the subject of ** ***** and this device from the necessity of transmitting a lot of information at high speed, and processing it, and LSI and VLSI are put in practical use.

[0002]On the other hand, improvement progresses and the part loading art to a printed-circuit board, [mounting / one side] [mounting / double-sided] It is shifting to the surface-mount technology (Surface Mount Technology abbreviation SMT) which equips with a lead terminal the pad which has carried out pattern formation on the printed-circuit board from through hole mounting with which a through hole is

equipped through a lead terminal.

[0003]

[Description of the Prior Art] By large scale-ization, package shape changes and, as for the electronic parts carried on a printed-circuit board using surface-mount technology, the number of lead terminals is increasing at an increasing tempo.

[0004] For example, speaking of the IC package of a semiconductor, from a DIP type (Dual In-line Package), [SOP / (Small Out-line Package)] It progresses to QFP (Quad Flat Package), the number of lead terminals increases from 44 pins of the beginning gradually with this, and it is 300. It has come to exceed a pin.

[0005] On the other hand, the pitch size of a lead terminal also becomes small gradually with this, and the example of mounting of QFP of a 0.4 mm pitch is reported to 1.0 mm by these days from 1.27 mm of the beginning again.

[0006] Thus, the size of the pad which pastes up and carries a lead terminal is also miniaturized as the number of lead terminals increases and a pitch interval contracts. Now, in order to carry parts with surface-mount technology (SMT), After screen-stenciling a solder paste on a printed-circuit board to pattern formation, now the pad which is using a metal mask, position ***** of the lead terminal of electronic parts was carried out, this pad was contacted, and the method of carrying out solder weld has been performed by letting the reflow furnace which has carried out temperature setting beforehand pass.

[0007] However, if the pitch of a lead terminal reduction-izes below to 0.5 mm, by the screen-stenciling method, the omission nature of the seal of a metal mask will be bad, and solder printing to a pad will become difficult.

[0008]

[Problem to be solved by the invention] In order to have performed surface mounting of electronic parts to the pad which has carried out pattern formation to the printed-circuit board, after printing a solder paste by the screen-stenciling method, were performing solder weld by contacting and heating the lead terminal of electronic parts, but. By the miniaturization of pad area, the omission nature of the seal of a metal mask is bad, and solder printing to a pad is becoming difficult.

[0009] Then, this measure is SUBJECT.

[0010]

[Means for solving problem] Above-mentioned SUBJECT forms a solder layer on a pad which has carried out pattern formation on a printed-circuit board, and Later, A process at which a method of making a lead terminal of a surface mounted part article weld in contact with this pad top screen-stencils only a resinous principle which constitutes a solder paste, and forms an adhesive layer on a pad of a printed-circuit board, A process of placing upside down right above a solder spraying tub which blows off solder powder in the shape of spraying by air pressure, conveying said printed-circuit board, making solder powder sticking on a pad, and forming a solder layer, It is solvable by constituting a mounting method of a surface mounted part article to a printed-circuit board by being characterized by consisting of a process of contacting, carrying out reflow **** of the lead terminal of a surface mounted part article on a pad of this printed-circuit board, and

welding a lead terminal.

[0011]

[Function]As a method of improving a thing with the bad omission nature of the seal of a metal mask when screen-stenciling a solder paste using a metal mask and forming a detailed pattern, the particle diameter of ** solder is made small.

** Improve the application nature of a paste. *****.

[0012]That is, if the particle diameter of solder is made to 30 micrometers or less about **, the omission nature of the seal of a metal mask should become good. however -- to this extent -- until -- when it is made small, oxidation of solder powder progresses and there is a problem which says that all serve as an oxide and hardly serve as a jointing material.

[0013]Although the composition ratio of solder and a resinous principle which constitutes the present solder paste is about 1:1, and various kinds of thickeners and active agents are added and it is formed from the necessity of holding the shake viscosity (Thixotropie) of a paste, and printability, about **, It is not appropriate from the amount of adhesion of solder falling to increase the percentage of a resinous principle.

[0014]Then, the inventor solved this problem by separating a resinous principle and solder powder as this measure, and adhering to the pad of a printed-circuit board. That is, as shown in drawing 1, on the printed-circuit board 1, various kinds of conductive patterns, such as wiring, are formed in addition to pad 2. (Above the Drawing A)

Only the resinous principle of a solder paste which carried out position ***** of the metal mask correctly, and prepared it independently for this printed-circuit board 1 on the pad 2 is screen-stenciled, and the adhesive layer 3 is formed. (Above the Drawing B)

Next, on this adhesive layer 3, the solder powder of the letter of spraying is made to adhere, and the solder layer 4 is formed. (Above the Drawing C)

By taking such a method, even when the size of the pad 2 is small, sufficient solder layer 4 can be formed, and thereby, poor junction can be eliminated.

[0015]Although drawing 2 shows the composition of the solder spraying tub 6 to which the solder powder of the letter of spraying is made to adhere, and the solder powder 7 in a tub blows off from the nozzle 9 by the air pressure in the turbine 8 and circulates through it, It is a thing which makes the solder powder 7 adhere on the adhesion tub 3 on the pad 2 by placing this nozzle 9 top upside down, and conveying the printed-circuit board 1 for it, The composition ratio of solder powder can be made to increase several times compared with the composition ratio of a solder layer based resinous principle and solder powder being 1:1 by taking this method.

[0016]

[Working example]Embodiment 1: As a printed-circuit board, it had the lead terminal of 400 book, and 10,000 pads used what has carried out pattern formation so that the pitch of a lead terminal could carry 25 QFP type ICs which are 0.4 mm.

[0017]a resinous principle -- the polymerization rosin 47g -- benzo[49 g of dipropylene glycols,

butylhydroxytoluene 0.5 g, and] -- doria -- ZORU 0.5 g, silicone antifoam 0.5 g, 1 g of hydrogenated castor oil, and JIECHIRU amine HBr 1g were added, and it adjusted.

[0018]And position ***** of the metal mask which carried out window opening of the pad position of a semiconductor device was carried out at a printed-circuit board, a resinous principle was screen-stenciled, and an adhesive layer of thickness of 100 mum was formed on a pad.

[0019]Next, put solder powder whose average particle diameter is 50 micrometers into a solder spraying layer, in the state where it is made to spray from a nozzle in a turbine, placed a printed-circuit board upside down, conveyed it, solder powder was made to stick, and a solder layer was formed.

[0020]25 QFP type ICs are positioned and carried in a ***** printed-circuit board, and it is an infrared reflow furnace (preset temperature is 370 **, 170 **, 170 **, and 370 ** from the entrance side) about this. Solder weld was let pass and carried out.

[0021]And as a result of investigating poor junction, as for poor junction, 35 in 10,000 terminals were accepted.

The comparative example 1 : [as composition of a solder paste] a resinous principle -- Embodiment 1 -- the same -- the polymerization rosin 47g -- benzo[49 g of dipropylene glycols, butylhydroxytoluene 0.5 g, and] - - doria -- ZORU 0.5 g, silicone antifoam 0.5 g, 1 g of hydrogenated castor oil, and JIECHIRU amine HBr 1g being added, and it adjusting, and, 670 g was added to this, and solder powder with an average particle diameter of 50 micrometers was kneaded to it, and was formed in it.

[0022]And this solder paste was screen-stenciled to the same printed-circuit board with having used it in Embodiment 1, 25 QFP type ICs were positioned and carried, and an infrared reflow furnace was made to carry out solder weld similarly through this.

[0023]And as a result of investigating poor junction, poor junction had attained to 3000 in 10,000 terminals.

[0024]

[Effect of the Invention]In the solder paste formed on a pad, operation of this invention could raise the composition ratio of a resinous principle and a solder ingredient to about 1:5, it corresponded to the miniaturization of the pad formed on a printed-circuit board, and it became possible to perform solder welding with sufficient reliability.

[Brief Description of the Drawings]

[Drawing 1]It is a sectional view showing the method of carrying out this invention.

[Drawing 2]It is a sectional view showing operation of a solder spraying tub.

[Explanations of letters or numerals]

1 Printed-circuit board

2 Pad

3 Adhesive layer

4 Solder layer

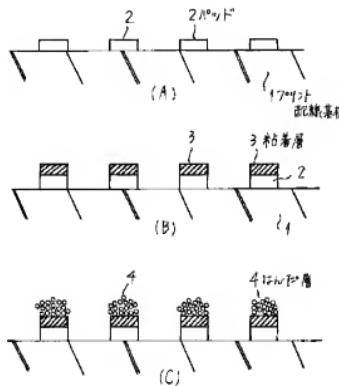
7 Solder powder

8 Turbine

9 Nozzle

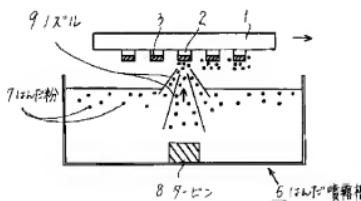
[Drawing 1]

本発明の実施法を示す断面図



[Drawing 2]

スパンターノ噴霧槽の動作を示す断面図



[Translation done.]